SHUL'TS, G.E.

Materials for a nature calendar in the neighborhood of the city of Stalinabad. Trudy AN Tadzh.SSR 99:69-78 '58. (MIRA 13:4)

(Stalinabad--Vegetation and climate)

SHU-'TS

SULT'TS, G.E.; kand.biol.nauk

In central Tajikistan. Priroda 49 no.9:124-125 S '60. (MIRA 13:10)

1. Botanicheskiy institut im.V.L.Komarova AN SSSR, Leningrad.
(Tajikistan—Autumn)

SHUL'TS, G.E.

Volunteer phenological network of the Geographical Society of the U.S.S.R. during the last ten years (1951-1960). Mat. po fen. no.2:2-7 '61. (MIRA 16:12)

SHUL'TS, G.E.

On Vladimir Alekseevich Batmanov's 60th birthday. Izv. Vses. geog. ob-va 93 no.4:345-346 Jl - Ag '61. (MIRA 14:7)
(Batmanov, Vladimir Alekseevich, 1900 -)

SHUL'TS, G.E.

Decision of the Coordinating Council of the Ministry of Agriculture of the U.S.S.R. Izv. Vses. geog. ob-va 94 no.4:362-363 Jl-Ag '62. (MIRA 15:9)

(Phenology—Research)

SHUL'TS, G.E.; BONDAR', V.V.; FEDULOVA, A.P.

Effect of foliar application of nitrogen fertilizers on the oxidation-reduction processes in cotton leaves. Trudy Bot. inst. Ser. 4 no.16:64-74 '63. (MIRA 17:2)

SHUL'TS, G.E. (Leningrad)

Winter flowering plants in the south of the U.S.S.R. Priroda 52 no.12:123-124 '63. (MIRA 17:3)

BORISOV, A.A., doktor geogr. nauk, prof.; ZNAMENSKAYA, O.M., kand. geogr. nauk; BLAGOVIDOV, N.L., kand. sel'khoz. nauk; MINYAYEV, N.A., kand. biol. nauk; SHUL'TS, G.E., kand. biol. nauk; RODIONOV, M.A., kand. biol. nauk; MAL'CHEVSKIY, A.S., prof., doktor biol. nauk; TOMSON, N., doktor med. nauk, prof., akademik; VERESHCHAGIN, N.K., doktor biol. nauk; NEYELOV, A.V., aspirant; TYUL'PANOV, N.M., inzh. lesnogo khoz.; KUROVSKIY, G.I., inzh.-parkostroitel'; SOKOLOV, M.P., arkhitektor; SOKOLOV, S.Ya., doktor biol. nauk, prof., nauchn. red.; MAL'CHIKOVA, V.K., red.

[Nature of Leningrad and environs] Priroda Leningrada i okrestnostei. Leningrad, Lenizdat, 1964. 249 p.
(MIRA 17:7)

1. Akademiya nauk Estonskoy SSR (for Tomson). 2. Zoologicheskiy institut AN SSSR (for Neyelov).

SHUL'TS, G.E., kand.biolog.nauk

In the land of eternal sunshine; influence of the continuous summer day on the seasonal development of trees and shrubs. Priroda 53 no.6:125-126 '64. (MIRA 17:6)

1. Botanicheskiy institut im. V.L.Komarova, Leningrad.

V

CHIL'[illegible], C.S.

Conference of the activist group of phenologists of the Geographical Society of the U.S.S.R. Izv. Vses. geog. ob-va 97 no.3:305-306 My-Je '65. (MIRA 18:8)

DONSKOY, Ivan Petrovich; PIMENOV, A.N., retsenzent, SHUL'TS, G.F., retsenzent; ARNSHTEYN, G.E., redaktor; YEPISHKINA, A.V., redaktor; KOLESNIKOVA, A.P., tekhnicheskiy redaktor.

[Transporting lumber by water] Vodnyi transport lesa. Moskva, Goslesbumizdat, 1955. 331p. (MLRA 8:11)
(Lumber--Transportation)

SHUL'TS, G. F., Cand Tech Sci -- (diss) "Selection of ~~type~~ designs of floating barriers [bony] [zapani] ~~of construction~~ and type of longitudinal floating guide-logs for timber floating." ~~water transport of lumber.~~" Len, 1957. 18 pp (Min of Higher Education USSR, Len Order of Lenin Forestry Engineering Acad im S. M. Kirov), 100 copies (KL, 1-58, 119)

"Selection of designs of floating barriers [bony] and type of longitudinal floating guide-logs [zapani] for timber floating."

SHUL'TS, G.I.

Truck-mounted motor drill for making pole-foundation holes.
Suggested by G.I.Shul'ts. Rats.i izobr.predl.v stroi.
no.12:35-37 '59. (MIRA 13:5)

1. Po materialam Ministerstva stroitel'stva RSFSR.
(Boring machinery)

SHUL'TS, G.M.

Construction of expenditure characteristics of relative increments for hydroelectric power stations of the power system of the Georgian S.S.R. Trudy Inst. energ. AN Gruz. SSR 17:51-62 '63. (MIRA 17:7)

DEVDARIANI, Yu.S.; SHUL'TS, G.M.

Optimum load distribution between the electric power plants of the Georgian S.S.R. Trudy Inst. energ. AN Gruz. SSR 17:63-76 '63. (MIRA 17:7) [illegible], V.V.; [illegible], G.M.

Use of a simplex method in planning the use of water power resources in the Georgian S.S.R. Soob. AN Gruz. SSR 35 no.3: 625-632 S '64. (MIRA 18:3)

1. Gruzinskiy nauchno-issledovatel'skiy institut energetiki im. A.I. Didebulidze, Tbilisi. Submitted March 26, 1964.

1. SHUL'TS, G. Ye

2. USSR (600)

4. Gissar Valley - Seasons

7. Seasons of the year in the Gissar Valley. Soob. TFAN SSSR no.22, 1950

9. Monthly list of Russian Accessions, Library of Congress, March 1953, Unclassified

1. SHUL'TS, G. YE.

2. USSR (600)

4. Cotton Growing

7. Too few plants per unit of area as a factor in the decrease in the yield of cotton. Soob.TFAN SSSR no. 31, 1951

9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

VASIL'YEV, K.G., doktor med. nauk, red.; SHUL'TS, I., red.; BITAR,A., tekhn. red.

[Serological epidemiology] Serologicheskaia epidemiologiia. Pod red. K.G.Vasil'eva. Riga, Izd-vo AN Latv.SSR, 1963. 83 p. (MIRA 17:3)

1. Latvijas Padomju Socialistiskas Republikas Zinatnu Akademija. Mikrobiologijas instituts.

*

VANAG, G.Ya.[Vanags, G.], otv. red.; ZELMENE, V., red.; KOPTELOVA,M.N., red.; BLYUGER, A., red.; KOVSH, O.Ya., red.; SHUL'TS, I., red.

[Phenyllin] Fenilin; sbornik statei. Riga, Izd-vo AN Latviiskoi SSR, 1964. 134 p. (MIRA 17:5)

1. Latvijas Padomju Socialistiskas Republikas Zinatnu Akademija. Organiskas sintezes instituts. 2. Institut organicheskogo sinteza AN Latviyskoy SSR (for Vanag, Koptelova).

KROGERIS. A.F.. kand. tekhn.nauk, otv. red.; BARZDAYNE, L.V., [Barzdaine, L.], kand. tekhn.nauk, red.; BIRZNIYEK, L.V.[Birznieks, L.], kand. tekhn. nauk, red.; PURIIIS. T.. red.; LAUKMANIS, L., red.; SHUL'TS, I., red.

[Semiconductors and their applications in electrical engineering] Poluprovodniki i ikh primeneniye v elektrotekhnike. Riga, Izd-vo AN Latviiskoi SSR. Vol.3. 1964. 261 p. (MIRA 18:12)

1. Latvijas Padomju Socialistiskas Republikas Zinatnu Akademija. Energetikas instituts.

TSINOVSKIY, Ya.P [Cinovskis, J.], doktor biol. nauk, otv. red.; OZOL, E.Ya.[Ozols, E.], prof., red.; RUPAYS, A.A.[Rupais,A.], kand. sel'khoz. nauk, red.; ZHERBELE, I.Ya.[Zerbele, I.], st. nauchn. sotr., red.; SHUL'TS, I.[Sults, I.], red.

[Forecasting in the protection of plants against diseases and pests] Prognoz v zashchite rastenii ot vreditelei i boleznei. Riga, Izd-vo AN Latv.SSR, 1964. 269 p. (MIRA 17:8)

1.Latvijas Padomju Socialistiskas **Republikas Zinatnu** Akademija. Biologijas instituts. 2. Botanicheskiy sad AN Latviyskoy SSR (for Rupays). 3. Institut biologii AN Latviyskoy SSR (for TSinovskiy). 4. Latviyskaya sel'skokhozyaystvennaya akademiya (for Ozols).

TSINOVSKIY, Ya.F., doktor biol. nauk, otv. red.; LUSIS, Ya.Ya.
[Lusis, J.], prof., red.; RUPAYS, A.A.[Rupais, A.],
kand. sel'khoz. nauk, red.; SHUL'TS, I., red.

[Fauna of the Latvian S.S.R. and adjacent territories]
Fauna Latviiskoi SSR i sopredel'nykh territorii. Riga,
Izd-vo AN Latviiskoi SSR. Vol.4. 1964. 332 p.
(MIRA 18:2)

1. Latvijas Padomju Socialistiskas Republikas Zinatnu Akademija.
Biologijas instituts. 2. Chlen-korrespondent AN Latviyskoy SSR
(for Lusis). 3. Institut biologii AN Latviyskoy SSR (for
TSinovskiy). 4. Botanicheskiy sad AN Latviyskoy SSR (for Rupays).

OZOL,A.M.[Ozols,A.], akademik, otv. red.; GUBAR',G.D.[Gubar,G.], kand. sel'khoz. nauk, red.; PETERSON, E.K.[Petersons, E.], kand. sel'khoz. nauk, red.; SHUL'TS, I., red.

[Photosynthesis and the productivity of plants] Fotosintez i produktivnost' rastenii. Riga, Izd-vo "Zinatne," 1965. 112 p. (MIRA 18:6)

1. Latvijas Padomju Socialistiskas Republikas Zinatnu Akademija. Biologijas instituts. 2. AN Latviyskoy SSR (for Ozol).

GILLER, S.A.[Gillers, S.], otv. red.; BLEYDELIS, Ya.Ya.
[Bleidelis, J.], red.; BLYUGER, A.F.[Blugers, A.]red.;
ZIDERMANE, A.A., red.; PRESS, B., red.; BRAMBERGA, V.,
red.; LIDAK, M.Yu.[Lidaks, M.], red.; KOVI, O., red.;
SHUL'TS, I.

[Cyclophosphane] TSiklofosfan; sbornik statei. Riga, Izd-vo "Znanie," 1965. 267 p. (MIRA 18:6)

1. Latvijas Padomju Socialistiskas Republikas Zinatnu Akademija. Organiskas sintezes instituts.

PERLI, P.D.; PORTNOV, F.G.; PETERSON, M.P.; SKARD, Ya.V.; SHUL'TS,I.,
red.; BITAR, A., tekhn. red.

[Treatment of patients at the health resorts of Latvia] Lechenie bol'nykh na kurortakh Latviiskoi SSR, 1963. 213 p.
(MIRA 17:3)

KRAUKLIS, A.; SHUL'TS, I.

[Self-regulation of higher nervous activity] Samoregu-
liatsiia vysshei nervnoi deiatel'nosti. Riga, Izd-vo
AN Latviiskoi SSR, 1964. 288 p. (MIRA 18:1)

FAYTEL'SON, Lev Aronovich; LINARTS, P.; BRIEDIS, I ; SHUL'TS, I.,
red.

[Experience in the vibropiston molding of prefabricated reinforced concrete constructions] Opyt vibroporshnevogo formovaniia sbornykh zhelezobetonnykh konstruktsii. Riga, Izd-vo AN Latviiskoi SSR, 1965. 84 p.
(MIRA 18:7)

MOREV, N.Ye.; SHUL'TS, I.A.; SMOLYANSKIY, N.A.; ITSKOVICH, Ya.S.

Mechanized TsNIIKHP-ML-4-59 make continuous production line with a daily capacity of 5 tons for making small-sized baked products. Trudy TSNIIKHP no.8:15-20 '60. (MIRA 15:8)

(Bakers and bakeries—Equipment and supplies)
(Assembly-line methods)

MOREV, N.Ye.; SHUL'TS, I.A.; KOMAROV, V.V.; SMOLYANSKIY, N.A.;
SOKOLOV, A.G.

Equipment for the mechanization of manual processes in the production of cracknel baked products. Trudy TSNIIKHP no.8:20-28 '60.
(MIRA 15:8)
(Bakers and bakeries—Equipment and supplies)

L 04520-67

ACC NR: AR6014099 SOURCE CODE: UR/0272/65/000/011/0112/0112

5

B

AUTHOR: Shul'ts, I. I.

TITLE: A measuring unit for a capacitive level gauge

SOURCE: Ref. zh. Metrologiya i izmeritel'naya tekhnika, Abs. 11.32.981

REF SOURCE: Sb. nauchn. tr. Gos. in-t po proyektir. i issled. vzryvobezopasn. elektrooborud. Giproniselektroshakht, vyp. 2, 1964, 201-203

TOPIC TAGS: electric measuring instrument, power supply, electric capacitance, electric discharge, resistor

ABSTRACT: An instrument developed by Giproniselektroshakht is described. It has a linear scale and can serve as the measuring unit of a capacitive level gauge and as a capacitance meter for capacitors. The instrument determines the average value of the current of a capacitor which has been overcharged with a constant frequency within definite limits of potential difference. When the switch is opened, the capacitor is discharged to the potential of the power supply; then the switch is closed and the discharge current passes through the measuring instrument. The value of the current passing through the measuring instrument is directly proportional to the capacitance being measured, i.e., the scale of the instrument is strictly linear. In order to ensure that the charge and discharge potential differences of

UDC: 389:681.128.63

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ACC NR: AR6014099

the capacitive pickup are independent of the supply voltage, a stabilitron is connected to the capacitor being measured through limiting diodes. The sensitivity of the instrument is regulated by changing the oscillator frequency with an additional capacitance. The fine adjustment of the sensitivity is accomplished with a resistor. Zero is set by compensating the initial value of the capacitance of the pickup. The instrument is powered by 220v, 50 hz ac line voltage; the power consumption is 25 va. The deviation in the readings when the supply voltage varies by ±10% is not over 1%. 2 illustrations. M. Mekler [Translation of abstract]

SUB CODE: 09

Card 2/2 egk

15-57-1-1034

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 1, p 165 (USSR)

AUTHORS: Novozhilov, V. N., Shul'ts, I. N.

TITLE: The Effect of the Method of Preparing Rocks on the Analyses to Determine Grain Size, Specific Gravity, and Limits of Plasticity (Vliyaniye sposoba podgotovki porody k analizu na opredeleniye granulometricheskogo sostava, udel'nogo vesa i predelov plastichnosti)

PERIODICAL: Zap. Leningr. gorn. in-ta, 1955 (1956) Vol 32, Nr 2, pp 166-187

ABSTRACT: By using a number of methods for preparing rocks for analysis and by comparing the results obtained, the authors conclude that the best separation of rocks that contain large quantities of carbonates and gypsum (rocks of the Tatarian stage of the Permian system) is obtained by treating with sodium pyrophosphate. They

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recommend a simple technique, requiring little time and no treatment with hydrochloric acid, for making grain-size analysis of high-carbonate marly rocks. A quantity of 10 g of rock is ground up with 10 ml saturated solution of sodium pyrophosphate. The pulverized mass is transferred to a conical flask and boiled for one hour with 200 ml of water. After boiling, the suspension is passed through a 0.25-mm screen into a cylinder and the sample is then drawn up by a pipette and the rate of fall of the particles is calculated according to Stoke's law. The method completely eliminates coagulation of the suspension and gives the best correspondence with the plasticity number. The authors conclude that determinations of specific gravity of the carbonate and gypseous rocks of the Tatarian stage in water, kerosene, and alcohol, all give approximately the same values. In kerosene, as a rule, the specific gravity is 0.02 less than in water. The degree of crushing of the sample, according to the authors, does not influence the value of specific gravity obtained. It is recommended that the specific gravity of such rocks be determined in

The Effect of the Method of Preparing Rocks (Cont.) 15-57-1-1034

water by the standard method. The presence of carbonates and gypsum strongly diminishes the value of the plasticity number in comparison with determinations for the same rocks when washed with carbonates and salts. The authors recommend that the plasticity number of highly carbonatic clay rocks be determined by the universally accepted standard method.

Card 3/3

I. M. G.

[illegible]

NOVOZHILOV, V.B., dotsent; SHUL'TS, I.N., nauchnyy sotrudnik.

Effect of the method for preparing rocks for analysis to determine granulometric composition, specific weight, and plastic limits. Zap.Len.gor.inst.32 no.2:166-187 '56. (MLRA 10:2)
(Rocks--Analysis)

51-3-7/14

AUTHORS: Gudris, N. M. and Shul'ts, I. N.

TITLE: Optical Absorption of $PbCl_2$ with a Stoichiometric Excess of Metal or Halogen. (Opticheskoye pogloshcheniye $PbCl_2$ so stekhiometricheskim izbytkom metalla ili galoida.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol.III, Nr.3, pp.246-250. (USSR).

ABSTRACT: Films of lead chloride ($PbCl_2$) were produced by vacuum deposition on a quartz base. These films were not thicker than 0.5 μ. Absorption was measured on a spectrophotometer СФ-4 relative to air, as well as by a differential method using another lead chloride film as a standard. The absorption spectra were measured in the region of the intrinsic absorption band (λ_{max} = 273 mμ). The lead chloride films were heated in vapours of metals or chlorine (additive coloring). Excess of lead was obtained by one of the following methods: (1) heating in lead vapour in an evacuated vessel; (2) repeated

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51-3-7/14

Optical Absorption of $PbCl_2$ with a Stoichiometric Excess of Metal or Halogen.

sublimation of lead chloride in vacuum; (3) deposition of a metallic layer of pure lead on the lead chloride film and subsequent heating in vacuum. In the absorption spectra of lead chloride films with excess of lead, additional absorption was observed (Fig.1). In Fig.1 curve 1 corresponds to the intrinsic absorption of lead chloride, curves 2 and 3 show absorption of a film heated to 300°C in lead vapours. Wavelengths of new absorption bands of films treated in the ways (1) to (3) are practically identical (Table on p.247). Simultaneously with the appearance of the new bands a decrease of the intensity maximum of the intrinsic absorption occurs in lead chloride with excess of lead. To study the nature of the absorption centres, samples of lead chloride films treated by vapours of mercury, cadmium, tin and sodium were prepared. It was found that the introduction of other metals into lead chloride films produced effects identical with those due to excess of lead. Fig.3 shows that with increase of temperature from 20°C (curve 1) to 100°C (curve 2) and 200°C (curve 3)

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Optical Absorption of $PbCl_2$ with a Stoichiometric Excess of Metal or Halogen.

intensities of the bands due to an excess of metal are decreased but positions of their maxima are not altered. The absorption spectra of lead chloride films with an excess of halogen, prepared by heating in chlorine, were also studied. In this case two new bands with maxima at 279 and 282 mμ were observed. Again an increase of temperature did not destroy the new absorption bands but simply decreased their intensities. In the absorption spectra of lead chloride films irradiated with X-rays (photochemical coloration) at 20°C all the absorption bands produced by various treatments described above are observed. The bands obtained using X-rays are less stable and an increase of temperature to 200°C destroys them. From the experimental data obtained by them the authors conclude that the absorption centres responsible for the additional bands are of electron and hole type. Further investigations will be necessary to decide finally the nature of these centres. There are 4 figures, 1 table and 3 references, 1 of which is Slavic.

51-3-7/14

Optical Absorption of $PbCl_2$ with a Stoichiometric Excess of Metal or Halogen.

ASSOCIATION: Leningrad State Pedagogical Institute imeni A.I. Gertsen.
(Leningradskiy gosudarstvennyy pedagogicheskiy institut imeni A. I. Gertsena.)

SUBMITTED: January 14, 1957.

AVAILABLE: Library of Congress

Card 4/4

HUL'TS I.N.

GUDRIS, N.M.; SHUL'TS, I.N.

Optical absorption of $PbCl_2$ with a stoichiometric excess of metal or halogen. Opt.i spektr. 3 no.3:246-250 S '57. (MIRA 10:9)

1. Leningradskiy gosudarstvennyy pedagogicheskiy institut imeni A.I.Gertsena.

(Lead chlorides--Optical properties)

Shul'ts Kalabusova

CZECHOSLOVAKIA / Chemical Technology. Food Industry. H-28

Abs Jour : Ref Zhur - Khim., No. 12, 1958, No 41435

Author : Shul'ts Kalabusova
Inst : ————————
Title : Drying of Acidophylus Milk (Yogurt) by Pulverization.

Orig Pub : Primusl potravin, 1957, 8, No. 6, 292-298

Abstract : The results of the work are given concerning a study on a possible production of dry acidophylus milk to replace liquid milk. The production of the acidophylus milk has been perfected for livestock foods.

Card 1/1

30620
S/058/61/000/008/027/044
A058/A101

18.8200

AUTHOR: Shul'ts, K.

TITLE: Some x-ray diffraction data on the Baushinger effect

PERIODICAL: Referativnyy zhurnal, Fizika, no. 8, 1961, 224, abstract 8E57 ("Tr. Tallinsk. politekhn. in-ta," 1960, v. A. no. 172-173, 3-38)

TEXT: The magnitudes and distribution of internal stresses in specimens of 45, 20 and 20X (20Kh) steels were roentgenographically determined for the purpose of studying the Baushinger effect. A special x-ray diffraction camera was designed. Investigation of interference-line broadening showed that deformation in the material is accompanied by block fragmentation and the appearance of microstresses. Oriented microstresses are the main cause of the Baushinger effect. Incident to the Baushinger effect line intensity change is observed, which is explained by a change in extinction and the appearance of distortions. There are 33 references.

X

[Abstracter's note: Complete translation]

Card 1/1

SHULTS, Kalle; TOMING, R., red.

[Units of measurement of physical quantities; International System of Units] Mõõtühikud füüsikaliste suuruste mõõtmiseks; rahvusvaheline mõõtuhikute süsteem SI. 2. trükk. Tallinn, Valgus, 1965. 86 p. [In Estonian] (MIRA 18:12)

SHULTS, K. Ya., Cand Phys-Math Sci -- (diss) "Roentgenographic investigation of the Baushinger effect." Tallin, 1960. 22 pp with graphs; (Academy of Sciences Estonian SSR, Division of Physics-Mathematics and Technical Sciences); 150 copies; free; (KL, 51-60, 116)

VASHCHENKO, A.I.; SHUL'TS, L.A.

One of the characteristics of heat processes in furnaces for the nonoxidizing heating of metals. Izv. vys. ucheb. zav.; chern. met. 7 no.3:203-211 '64. (MIRA 17:4)

1. Moskovskiy vecherniy metallurgicheskiy institut.

BEZBORODOV, A.M.; SHUL'TS, L.M.

Restoration of the free amino acids in the mycelium of actinomyces following nitrogen starvation. Eksp. i klin. issl. po antibiot. 2: 47-52 '60. (MIRA 15:5)
(ACTINOMYCES) (AMINO ACID METABOLISM)
(NITROGEN METABOLISM)

BEZBORODOV, A.M.; URUSOVA, S.S.; CHERMENSKIY, D.N.; SHUL'TS, L.M.;

Biosynthesis of amino acids in the cultivation of actinomycetes on various media and the effect of inhibitors on this process. Mikrobiologiia 32 no.3:385-390 My-Je'63 (MIRA 17:3)

1. Leningradskiy khimiko-farmatsevticheskiy institut.

GANUSH, V. [Hanus, V.]; DOLEYSH, L. [Dolejs, L.]; SHUL'TS, L.

Filling system for measuring the mass spectra of nonvolatile organic compounds. Prib. i tekh. eksp. 9 no.1:215-217 Ja-F '64. (MIRA 17:4)

1. Institut fizicheskoy khimii i Institut organicheskoy khimii i biokhimii Akademii nauk Chekhoslovatskoy Sotsialisticheskoy Respubliki, Praga.

L 43946-65 EWA(b)-2/EWA(j)/EWT(1) Pa-4 JK

ACCESSION NR: AP5008020 S/0016/65/000/003/0141/0141

26

AUTHOR: Titrova, A. I.; Shul'ts, L. M.; Tel'bukh, V. P.

25

TITLE: A comparative study of the productivity of nutrient media in Leptospira incubation

b

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 3, 1965, 141

TOPIC TAGS: microorganism culture, Leptospira, nutrient medium, culture medium, vitamin B complex, glycerine, amino acid metabolism, nitrogen metabolism

ABSTRACT: Leptospira pomona growth was studied in solid, liquid, and semi-liquid culture mediums in three series of experiments. In a fourth series nitrogen metabolism of Leptospira pomona, Leptospira grippotyphosa, and Leptospira icterohaemorrhagiae was studied in a liquid culture medium. Leptospira failed to grow in a solid culture medium and grew very poorly in a semi-liquid medium. Best productivity results were obtained in liquid culture mediums with the addition of glycerine or the B complex vitamins. In incubating the

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L 43946-65

ACCESSION NR: AP5008020

three Leptospira serological types, the metabolism processes of Leptospira icterohaemorrahagiae were more intense than those of the other two types. The addition of glycerine and B complex vitamins stimulated culture growth and intensified the utilization of such essential amino acids as aspartic acid, glutamic acid, cystine, tryptophane, serin, and arginine. For all three Leptospira types the total nitrogen level of a culture medium filtrate was directly dependent on quantitative changes of hydrolyzate amino acid composition. Orig. art. has: None.

ASSOCIATION: Stavropol'skiy institut vaksin i syvorotok (Stavropol'skiy Institute of Vaccines and Serums)

SUBMITTED: 21May64 ENCL: 00 SUB CODE: LS

NR REF SOV: 000 OTHER: 000

Card 2/2

SHUL'TS, L. S.

6980. SHUL'TS, L. S. Pamyatka o primenenii rabochikh protezov invalidami s kul'tyama predplech'ya ili ki sti vypolnenii stolyarnykh, plotnich'ikh i slesarnykh, a takzhe razlichnykh sel'skokhozyaystvennykh rabot. M., 1954. 31 s. s ill. 22sm. (M-vo sots. obespecheniya RSFSR. Tsentr. navch. -issled. in-t ekspertizy trud sposobnost. i organizatsii truda invalidov TsIETIN). 2.000 ekz. Besp1. [55-1980] 617.3+617.57-089.28

Knizhnaya Letopis' No. 6, 1955

SHUL'TS, L.S., kand.tekhn.nauk

New types of working prostheses and sockets. Ortop.,travm.i protez. 22 no.3:58-61 '61. (MIRA 14:4)

1. Iz TSentral'nogo nauchno-issledovatel'skogo instituta ekspertizy trudosposobnosti i organizatsii truda invalidov Ministerstva sotsial'nogo obespecheniya RSFSR (dir. - prof. D.I. Gritskevich).

(ARTIFICIAL LIMBS)

USSR / Soil Science. Soil Genesis and Geography. J

Abs Jour: Ref Zhur-Biol., No 7, 1958, 29425.

Author : Varbalis, P., Shul'ts, S.; Gurskiy, V.
Inst : Not given.
Title : A Change in Several Peat Carbonate Soil Properties on High Yielding Plots. (Izmeneniye nekotorykh svoystv dernovokarbonatnykh pochv na uchastkakh s vysokim urozhayem).

Orig Pub: Pochva i urozhay, Riga, 1957, 6, 83-103.

Abstract: The changes are examined in moisture, waterproof aggregate content and the intensity of nitrification processes in peat carbonate leached cultivated soils, planted with grain crops, sugar beets and perennial grasses. The observations were made on the grounds of the "Skangali" experimental base in Yelgaskiy Rayon in 1952 and 1955.

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SHUL'TS, S.A., starshiy elektromekhanik

Semaphore lenses should be made of plastics. Avtom. telem. i sviaz' 2 no.12:20 D '58. (MIRA 11:12)

1. Molodechnenskaya distantsiya signalizatsii i svyazi Belorusskoy dorogi. (Railroads--Signaling) (Lenses)

SHUL'TS, M.M.

USSR.

~~GERM~~.

Investigation of the sodium function of the glass electrode. M. M. Shul'ts. *Uchenye Zapiski Leningrad. Gosudarst. U*[redacted]*him. Nauk* No. 13, 80-156(1953);

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Referat. Zhur., Khim. 1952, No. 32100.—The purpose of this investigation was to prove by expt. the existence of a Na function in a glass electrode and a study of the relation between the e.m.f. of the glass electrode and the compn. of solns. in the region of the Na function and in the region of transition of the H function and the Na function. To this end, glass electrodes and Na (amalgam) electrodes were compared in circuits free of diffusion potentials. The membrane-type glass electrodes were made of 6 kinds of glass, and each of these was studied in (1) solns. buffered at pH 2–14, with a const. concn. of Na^+ (0.1 and 2.0*M*); (2) variable concn. of NaOH (0.1–6.8*M*); and (3) variable concn. of NaCl (up to 4*M*) and Na_2SO_4 (up to 1*M*) at const. concn. of NaOH (0.1 and 2.0*M*). Within the limits of exptl. error (1 mv.) all the electrodes had a Na function at definite compn. of the solns. for each studied glass. In glasses free of B_2O_3 and Al_2O_3 or contg. not more than 3.5% of B_2O_3, the Na function appeared only in strongly alk. soln. When the sum of B_2O_3 and Al_2O_3 in the glass was 14%, the Na function appeared in neutral and even in acid solns. Glass electrodes of this type had a practical value as Na electrodes and were preferred to amalgam electrodes. Change of the nature and concn. of the anions in the soln. did not affect the Na function. Alkali and alk. earth metals caused a shift of the Na function when their concn. exceeded the concn. of Na^+ by a definite multiple, e.g., in case of Ba^{++} it was 50 times. By changing the compn. of the soln. a glass electrode of a definite compn. could change from a complete H function to a complete Na function. The potential of the glass electrode with reference to the H electrode in the same soln. was detd. by the ratios of activities of Na^+ and H^+ and was independent of the abs. concn. values of these ions.

M. Hosch

SHUL'TS, M.M.

Study of the sodium function of glass electrodes. Uch.zap.Len.un. 169:80-156 '53. (Electrodes, Glass) (MLRA 9:6)

Shul'Ts, M.M.

2

4

Influence of foreign ions on sodium function of glass electrodes. M. M. Shul'ts and T. M. Ovchinnikova. Vestnik Leningrad. Univ. 9, No. 2, *Ser. Mat. Fiz. i Khim.* No. 1, 129-39(1954).—The influence was studied of foreign cations in soln. on the electrode potential of a glass electrode (contg. SiO_2 71, B_2O_3 11, Al_2O_3 3, and Na_2O 15 mole %) in a cell: Ag|AgCl, *M*NaCl|glass|NaCl,MCl, AgCl|Ag at 18-20°, M = the foreign cation. Deviation from the theoretical dependence on the Na^+ activity was independent of the abs. concn. of M, but varied only with $M:Na^+$ ratio. Deviations became apparent on reaching the following ratios: K 2, NH_4 20, Ca 20, Ba 50, Mg 20-40. These results were in agreement with the ion-exchange theory of action of the glass electrode. The weak influence of Ca, Ba, and Mg was explained by much less efficient exchange, as compared with K, for Na^+ in the glass electrode. NH_4^+ probably formed only weak bonds when substituting for Na^+.

Andrew Dravnieks

Chem

pH

PM

SHUL'TS, M.M.

2

7 Changes in the chemical potentials and in the partial pressures of the components of ternary, two-phase systems during isothermal-isobaric changes in composition. A. V. Storonkin and M. M. Shul'ts. *Vestnik Leningrad. Univ.* 9, No. 11, *Ser.* [redacted]. No. 4, 153-65(1954).—The relation between the changes in compn. and the chem. potentials of ternary, 2-phase systems at const. pressure and temp. was derived. The conditions for which the potentials and the partial pressures have a max. or min. were detd. Rules were formulated for the direction of the changes in chem. potential and partial pressure of the components during isothermal, and isothermal-isobaric changes in compn. of the solns. J. Rovtar Leach

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PM

SHUL'TS, M.M.; AYO, L.G.

Glass electrodes with a sodium function. Vest.Len.un. 10 no.8:153-162 Ag '55. (MLRA 9:1)
(Electrodes, Glass)

SHUL'TS, M.M.

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6

Use of glass electrodes having a sodium function for water analysis. P. A. Kryukov, M. M. Shul'ts, and V. E. Goremykin (Hydrochem. Inst., Acad. Sci. U.S.S.R., Novocherkask). *Gidrokhim. Materialy* 24, 23-7(1955).—Application of glass electrodes with the sodium function (cf. *C.A.* 49, 7424*i*) for detn. of the concn. of Na ions in water is discussed and results of detns. are presented.

N. Charmandarian

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Shul'Ts, M.M.

3

Chem

Changes in the chemical potentials and in the partial pressures of the components of heterogeneous systems during isothermal-isobaric changes in composition. II. M. M. Shul'ts and A. V. Storonkin. *Vestnik Leningrad.* ~~*Univ.* 11, No. 22,~~ *Ser. Fiz. i Khim.* No. 4, 111-23(1956); cf. *C.A.* 50, 9126d.—The relation between changes of intensive and of extensive parameters of heterogeneous systems is examd. thermodynamically in a general form. The results are applied at const. pressure and temp. to ternary systems consisting of 2 phases of variable compn. The slopes of tie-lines are related to the rate of change of chem. potential of a component with respect to its mole fraction in the system as a whole. A graphic method is given for finding the sector within which the tie-lines must lie that connect compns. of ternary solns. and of ideal vapors in equil. with them. J. D. Porter

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SHUL'TS M. M.

AUTHOR: None Given.

62-11-29/29

TITLE: General Meeting of the Department for Chemical Sciences of the AN USSR Held in May 30-31 and June 28, 1957 (Obshchiye sobraniya Otdeleniya khimicheskikh nauk Akademii nauk SSSR 30-31 maya i 28 iyunya 1957 g).

PERIODICAL: Izvestiya AN SSSR, Otdel. Khim. Nauk, 1957, Nr 11, pp. 1416-1419 (USSR)

ABSTRACT: Chairman: Member of the Academy A. P. Vinogradov. Lectures: A. N. Terenin, Member of the Academy. "Spectroscopy of the Molecular Compounds with Metal Halides." V. N. Filimonov, the student D. Borzovyy and Sh. Sh. Raskin helped the author in his work.
S. Z. Roginskiy, corresponding Member of the Academy, B. V. Nekrasov, corresponding Member of the Academy, N. D. Sokolov, Doctor of chemical sciences, M. M. Shemvakin, corresponding Member of the Academy, A. I. Kitaygorodskiy, Doctor of physico-mathematical sciences, A. P. Vinogradov, Member of the Academy, took part in the discussion.
B. P. Nikol'skiy, corresponding Member of the Academy of

Card 1/3

B. V. Nekrasov, corresponding Member of the Academy, Ye. S. Makarov, Doctor of chemical sciences, V. G. Kuznetsov, and S. Z. Roginskiy, corresponding Member of the Academy of the AN USSR took part in the discussion. M. M. Koton, Doctor of chemical sciences (partaking author Yu. V. Mitin) spoke on "The Synthesis of Po[illegible] in the chain.

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62-11-29/29

General Meeting of the Department for Chemical Sciences of the AN USSR Held in May 30-31 and June, 28, 1957

June 28, 1957: Chairman: N. N. Semenov, Member of the Academy, Kargin, Valentin Alekseyevich, Member of the Academy spoke on "The Structure and Phase-Condition of Polymers."
G. L. Slonimskiy (partaking authors T. I. Sogolova and V. A. Kargin) spoke on "The Particularities of Flow in Polymers."
N. V. Mikhaylov, Doctor of chemical sciences (partaking authors V. I. Mayboroda and V. A. Kargin) spoke on "The New Production Methods for Viscous Tibers". V. I. Sharkov, Professor, S. Z. Roginsky, corresponding Member of the Academy, V. I. Ivanov, Doctor of chemical sciences took part in the discussion. Welcome speeches were held by N. N. Semenov, Member of the Academy, D. P. Novikov, Minister-Representative for chemical industry, V. I. Veselovskiy, Professor, Ya. I. Gerasimov, corresponding Member of the Academy, P. A. Rebinder, Member of the Academy and Ye. O. Kuvshinskiy, Professor.

AVAILABLE: Library of Congress

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SOV/54-58-3-14/19

AUTHORS: Shul'ts, M. M., Parfenov, A. I.

TITLE: The Investigation of the Behavior of Glass Electrodes With Sodium Metal Function in Water-Alcohol Solutions of Sodium Chloride (Issledovaniye povedeniya steklyannykh elektrodov s natriyevoy funktsiyey v spirto-vodnykh rastvorakh khloristogo natriya)

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1958, Nr 3, pp 118-125 (USSR)

ABSTRACT: In the present work the authors investigated the influence of non-aqueous solvents upon the behavior of glass electrodes with sodium metal function and explained the possibilities of their practical application in these media. The electrodes were made of glass of the following composition (in molar percent): Glass Nr 11: Na_2O - 25 %, B_2O_3 - 11 %, Al_2O_3 - 3 %, SiO_2 - 61 %; Glass Nr 13: Na_2O - 25 %, B_2O_3 - 9 %, Al_2O_3 - 5 %, SiO_2 - 61 %. In aqueous solutions of sodium chloride these glass types exhibit a sodium function at pH = 4 and above. Experiments with saturated sodium chloride solutions were

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The Investigation of the Behavior of Glass Electrodes With Sodium Metal Function in Water-Alcohol Solutions of Sodium Chloride

carried out. No specific influence of the solvent upon the behavior of the glass electrode was observed. This fact permits to assume that such electrodes can be employed in the investigation of the thermodynamic properties of sodium salts in various organic water-diluted solvents and in organic solvents of an alcohol type. Furthermore the behavior of the glass electrodes in water-methanol solutions of sodium chloride was examined. In the first series of experiments the behavior of glass and of sodium amalgam electrodes in water-diluted methanol as solvent was compared. In the second series of experiments changes of the chemical potentials of solutions of sodium chloride in little water-diluted methanol were investigated by means of glass electrodes. The results found by means of glass and amalgam electrodes agree well with each other. Glass electrodes with a metal function exhibit certain advantages as compared to amalgam electrodes: They render possible the measurement of the salt activity and of alkaline metal bases even in weakly acid solutions. Measurements can be performed in more diluted solutions than with amalgam electrodes. Glass electrodes with metal function can be employed in the salt

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SOV/54-58-3-14/19

The Investigation of the Behavior of Glass Electrodes With Sodium Metal Function in Water-Alcohol Solutions of Sodium Chloride

solutions of various metals in a relatively wide range of their relative content. The activity of alkaline metal compounds can be determined much easier by means of glass electrodes than by means of amalgam electrodes. Furthermore the change of the chemical potentials of sodium chloride in the system $H_2O-CH_3OH-NaCl$ at different concentrations of the components was investigated. As table 6 shows the substitution of water by methyl alcohol in a number of solutions with constant percentage leads to an increase of the chemical potential of sodium chloride. This seems to be reflected also by the influence of alcohol on the solubility of sodium chloride in the system, i.e. a weaker solubility in the case of higher alcohol content in the solvent. The authors express their gratitude to B. P. Nikol'skiy for valuable suggestions. There are 6 tables and 17 references, 12 of which are Soviet.

Card 3/4

SHUL'TS, M.M.; PARFENOV, A.I.

Behavior of glass electrodes with sodium function in alcoholic aqueous solutions of sodium chloride [with summary in English]. Vest. LGU 13 no.16:118-125 '58. (MIRA 11:11)

(Electrodes, Glass) (Sodium chloride)

[illegible] M.

AUTHORS:	Nikol'skiy, B. P., Shul'ts, M. M., Peshekhonova, N. V.	76-1-3/32
TITLE:	The Theory of the Glass Electrode (Teoriya steklyannogo elektroda) VII. The Effect of Foreign Ions on the Sodium and Potassium Functions of Glass Electrodes (VII. Vliyaniye postoronnikh ionov na natriyevuyu i kaliyevuyu funktsiyu steklyannykh elektrodov)	
PERIODICAL:	Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 1, pp. 19-26 (USSR)	

ABSTRACT:

The following problems were investigated here: 1) The influence of foreign ions on the sodium function of glass electrodes at various temperatures. 2) The presence of a potassium function wit glass electrodes of potash glass and the influence of various cations of various temperatures on the potash functi n. In order to carry out exactly the investigations of the thermocynamic properties of the sodium glass electrode a galvanic without transfer was used.

-Ag AgCl, inner solution glass membrane outer solution

AgCl Ag$^+$ (1)

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The Theory of the Glass Electrode. VII. The Effect of 76-1-3/32
Foreign Ions on the Sodium and Potassium Functions of Glass Electrodes

with the corresponding index means the magnitude of the potential jump at the limit of two touching phases. A sodiumchloride solution was used as inner and outer solution. Alumoborium-silicate glass, the composition of which varied only within certain limits, was used. This glass differs from that serving for the production of glass electrodes with a hydrogen function only insofar as the hydrogen function is much less pronounced here. Every experiment consisted of two parts: a measurement of the decrease of e.m.f. - E in pure sodium chloride solution and the measurement of E in compound solutions. Results: 1) Investigation of the influence of various cations on the sodium function of glass electrodes. The reaction of sodium glass electrodes in compound solutions of sodium chloride as well as in the chlorides of hydrogen, potassium, lithium, rubidium, ammonium, magnesium and calcium at 20, 35, 60 and 65°C were investigated. The authors show that the hydrogen ion exercizes the greatest influence on the sodium function of the glass electrode. This is followed with decreasing influence by the ions of potassium, rubidium, magnesium and calcium. The position of the lithium ion among alkaline

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cations is anomalous from the point of view of its influence on the sodium function of the glass electrode. The exact analysis of this anomalously small influence will be given in the following work. In order to characterize the influence of the temperature on the sodium function in a semiquantitative manner of the glass electrode in pure sodium salt solutions the theoretical coefficient = 2,3 RT/F of the equation for the glass electrode is compared with the experimental magnitude $_e$; i. e. the angular coefficient of the inclination of the straight line E = f(lg a_{NaCl}). The authors show that the influence of the temperature on the difference between and $_e$ is small and that with a rise of temperature both values approach each other. The authors also show that (based on the experimental curves) a rise of temperature mostly extends a little the domain of the basic electrode function. 2) The investigation of the potassium function of glass electrodes. Here a galvanic cell was used which was built according to the following scheme:

The Theory of the Glass Electrode. VII The Effect of Foreign 76-1-3/32
Ions on the Sodium and Potassium Functions of Glass Electrodes

Ag	AgCl, KCl 1,0 M within the electrode	Kali glass	KCl + HCl, AgCl on the outside of the electrode	Ag

The authors show that (with the experiments with potassium electrodes in pure KCl solutions) for the given glass composition the potassium function of the electrodes would possess about 94% of the value of the theoretical function appertaining to an ideal potassium electrode. They further show that the hydrogen ion has the greatest effect on the electrode function of potassium glass. This is followed by sodium-, lithium-, barium-, magnesium- and calcium-ions. The lithium ion, as is the case with sodium glass, influences the potassium function of the glass electrode anomalously little. There are 5 figures, 5 tables, and 16 references, 7 of which are Slavic.

ASSOCIATION: Leningrad State University imeni A. A. Zhdanov (Leningradskiy gosudarstvennyy universitet imeni A. A. Zhdanova)

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The Theory of the Glass Electrode. VII. The Effect of Foreign Ions on the Sodium and Potassium Functions of Glass Electrodes 76-1-3/32

SUBMITTED: July 6, 1956

AVAILABLE: Library of Congress

Card 5/5

76-38-2-6/38

AUTHORS: Nikol'skiy, B. P. , Shul'ts, M. M. , Peshekhonova, N. V.

TITLE: The Theory of Glass Electrodes (Teoriya steklyannogo elektroda) VIII. The Transition of Glass Electrodes From a Metal Function to Other Functions (VIII. Perekhod steklyannykh elektrodov ot odnoy metallicheskoy funktsii k drugim)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 2, pp. 262-269 (USSR)

ABSTRACT: The problem was investigated to what extent the one or other electrode with certain electrode function is capable of satisfying another electrode function, i.e. being capable of showing a reverse effect with regard to the ion originally not contained in the glass. In consequence of the experiments carried out it can be maintained that in the action of a foreign alkaline kation on a glass electrode with metal function the electrode obtains another metal function corresponding to this kation. This new metal function occurs with an accuracy of up to 5 %. The calculation of the ion exchange

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76-32-2-6/38

The Theory of Glass Electrodes . VIII. The Transition of Glass Electrodes From a Metal Function to Other Functions

constants for sodium glass electrodes is carried out. This is also valid, however, for electrodes of potassium glass. It is shown that the ion exchange between glass- and water phase mainly depends on the magnitude of the energy of binding of the exchange ions with the glass phase as well as on their energy with regard to the binding with the water phase. It can be assumed that the ion binding which depends on the ion size plays the main part in the glass phase. To this is added the action of the polarizability of the anions contained in the glass. As regards the binding of the ions with the water medium its stability essentially depends on the interaction of the ions with the water dipoles. Here the binding energy in this case to a much greater degree depends on the distance of the particles than does the energy of the ion binding in the glass phase. The correlation between these two kinds of energies also mainly determines the direction of the ion-exchange reaction. In the concentration of this energetic correlation that energy, occurring when the ion in entering the glass meets with a resistance of steric character, was not taken into account. As conclusion it was stated: in sodium glasses a transition from the basic sodium function to the

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function of potassium is possible. With potassium glasses a transition from the potassium function to the sodium function is possible. The transition from one metal function to the other is explained by means of the ion-exchange theory. Based on the hypothesis of the ion-exchange theory of the glass electrode the exchange constant for 4 aluminum-borosilicate glasses was calculated. It was found that in the exchange reaction

$$Na^+_{(glass)} + H^+_{(solution)} \rightleftarrows Na^+_{(solution)} + H^+_{(glass)}$$

the equilibrium constant for the investigated sodium-aluminum-borosilicate glasses is greater by 12 orders of magnitude than in the case of ЭC-1 glass. The values of constants computed here prove the order arranged in Reference 1 for kations of alkaline metals after their action on the sodium- or potassium function of glass electrodes. The anomalous position of lithium in this order was discussed here from the viewpoint of the energetic correlations in the ion-exchange process. There are 2 figures, 4 tables, and 15 references, 7 of which are

76-32-2-6/38

The Theory of Glass Electrodes. VIII. The Transition of Glass Electrodes From a Metal Function to Other Functions

Soviet.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: July 6, 1956

1. Glass electrodes--Properties 2. Ion exchange--Theory
3. Glass electrodes--Exchange reactions

Card 4/4

5(4) SOV/76-32-11-9/32

AUTHORS: Shul'ts, M. M., Storonkin, A. V., Markova, T. P.

TITLE: Investigation of the Chemical Potentials and Activity Coefficients of the Components of Binary Solid Solutions by the Method of the Third Component (Issledovaniye khimicheskikh potentsialov i koeffitsiyentov aktivnosti komponentov binarnykh tverdykh rastvorov metodom tret'yego komponenta)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 11, pp 2518-2524 (USSR)

ABSTRACT: Although the described method mentioned in the title is not of a general type, it may be employed within a wide field, especially in the investigations of solid solutions formed from salts. The method is indirect and may be regarded as highly thermodynamic. The limits of applicability of this method are given. The principle of the method is based on the determination of the changes of the chemical potentials of the components of the binary solid solution according to the data of the solubility in a liquid solvent (third component) and data on the dependence of the chemical potential on this solvent, as well as on its composition. The solid solution

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Investigation of the Chemical Potentials and Activity Coefficients of the Components of Binary Solid Solutions by the Method of the Third Component

K_2SO_4-$(NH_4)_2SO_4$ was investigated. The phase composition and the steam pressure of the saturated solutions K_2SO_4-$(NH_4)_2SO_4$-H_2O were determined at 25°. The solid solutions were synthesized according to a method by V. G. Khlopin et al. (Ref 7). The composition of the solid phases was determined according to a method by Shreynemakers. The measuring results obtained (Table 1) agree well with the data given in publications (Refs 4,5,6). A comparison of the experimental results showed that the solid solutions are richer in sulfate ions than the liquid solutions. From the obtained experimental data the changes of the chemical potential, the activity coefficients of the components and the free energies of the solid solutions K_2SO_4-$(NH_4)_2SO_4$ at 25° were calculated (Table 2). These solid solutions show a deviation from the ideal state (Figs 1,2). This is explained by a relatively greater change of the lattice structure, due to the exchange of the smaller potassium ions by the bigger ammonium ions than it is the case in an exchange of the ammonium ions by K-ions.

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There are 2 figures, 2 tables, and 12 references, 7 of which are Soviet.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: April 30, 1957

Shul'ts, M.M.

24(8) PHASE I BOOK EXPLOITATION SOV/2509

Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk

Termodinamika i stroyeniye rastvorov; trudy soveshchaniya... (Thermodynamics and Structure of Solutions; Transactions of the Conference Held January 27-30, 1958) Moscow, Izd-vo AN SSSR, 1959. 295 p. 3,000 copies printed.

Ed.: M. I. Shakhparonov, Doctor of Chemical Sciences; Ed. of Publishing House: M. G. Yegorov; Tech. Ed.: T. V. Polyakova.

PURPOSE: This book is intended for physicists, chemists, and chemical engineers.

COVERAGE: This collection of papers was originally presented at the Conference on Thermodynamics and Structure of Solutions sponsored by the Section of Chemical Sciences of the Academy of Sciences, USSR, and the Department of Chemistry of Moscow State University, and held in Moscow on January 27-30, 1958. Officers of the conference are listed in the Foreword. A list of other reports also read at the conference, but not included in this book, are given. Among the problems treated in this work are: electrolytic solutions, ultrasonic measurement, dielectric and thermodynamic properties of various mixtures, spectroscopic analysis, etc. References accompany individual articles.

Shakhparonov, M. I. Present Problems of the Thermodynamic Theory of Solutions of Nonelectrolytes 36

Skripov, V. P. Fluctuation of Energy in Solutions and Their Relation to Heat Capacity 43

Fisher, I. Z., and V. I. Kuz'mich. Molecular Theory of Solubility 48

Krichevskiy, I. R., and N. Ye. Khazanova. Critical Phenomena in Binary Liquid Systems 49

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Bartenev, G. M., and A. A. Remizova. Phase Transitions in Simple Systems and Their Classification 67

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Sventoslavskiy, V. V., and K. I. Zemborak. Transformation of Binary Heteroazeotropes Into Homoazeotropes and Homozeotropes 79

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Vasil'yev, V. P. Thermodynamics of "Aquacomplexes" 140

Lengyel, Sandor. Study of Partial Pressure of Solvent in Aqueous Solutions of Electrolytes 144

Minc, Stefan. Interactions of Proton With Molecules (Water, and Methyl, Ethyl and n-Propyl Alcohols) 152

SOV/76-33-9-5/37

.5(4)

AUTHORS: Nikol'skiy, B. P., Shul'ts, M. M., Peshekhonova, N. V.

TITLE: The Theory of the Glass Electrode. IX. The Application of the Ion-exchange Theory to Glass Electrodes With Different Metallic Functions

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 9, pp 1922-1927 (USSR)

ABSTRACT: The results of the investigations carried out so far (Refs 1-7) and of the paper under review permit the statement that glass electrodes (GE) assume a new electrode function through the exchange of the hydrogen ions of the sodium in the glass with cations from the solution, and thus change over from one metallic function to another. The experimental results of previous papers (Refs 6,7), obtained with (GE) of aluminum borosilicate glasses, are judged in the paper under review in conformity with the simple theory of the ion-exchange of the (GE). The theoretical change of the electromotive force (EMF) ΔE_T through concentration-changes of NaCl in the galvanic element

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The Theory of the Glass Electrode. IX. The Application of the Ion-exchange Theory to Glass Electrodes With Different Metallic Functions

Ag | AgCl, NaCl (a) Inner Solution | Glass membrane | NaCl (a')+MCl, AgCl Outer Solution | Ag (I)

was computed in conformity with an equation (4), and compared with the experimental values of ΔE of (I) ($\Delta E = E' - E''$; difference of the experimental values of the (EMF) of (I), with E' representing the (EMF) at a concentration of the NaCl=1 in the outer solution) (Table values for ΔE with NaCl+HCl mixtures at various temperatures). Glasses of the following composition were used for the tests: Nr 1: 75% SiO_2, 3% Al_2O_3, 11% Ba_2O_3, 11% Na_2O; Nr 2: 71% SiO_2, 3% Al_2O_3, 11% Ba_2O_3, 15% Na_2O. For the tests with mixed NaCl+HCl solutions, data were taken from (Ref 9), while the coefficients of activity for experiments with NaCl+KCl and NaCl+LiCl solutions were calculated in conformity with the method by B. P. Nikol'skiy and V. A. Rabinovich (Ref 10). It was established that the simple ion-exchange theory is confirmed within the limits of the accuracy of measurements for the transition of the (GE) from a sodium-

SOV/76-33-9-5/37

The Theory of the Glass Electrode. IX. The Application of the Ion-exchange Theory to Glass Electrodes With Different Metallic Functions

function to the potassium- or lithium-function. Some deviations of the experimental data from the theoretical values in the transition zone during the exchange of the Na-ions from glass with hydrogen ions from the solution, can be explained in conformity with the generalized ion-exchange theory (Ref 11), (as for glass of the type ES-1), by the presence of various an- types of bonds between the hydrogen ions and the silicate ions of glass. On the basis of previous investigations (Refs 8, 11) it was not possible to establish clearly whether the last mentioned difference of bonds is valid only for hydrogen ions or also for metal ions. The experimental data obtained indicate however that the transition of the (GE) from a metallic electrode function to the other responds also in the transition zone of the simple ion-exchange theory, i.e. that the ions of the sodium, potassium and especially of lithium (as distinct from hydrogen) show bonds equal in energy with the silicate lattice of glass. There are 3 figures, 1 table, and 11 references, 7 of which are Soviet.

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SOV/76-33-9-5/37

The Theory of the Glass Electrode. IX. The Application of the Ion-exchange Theory to Glass Electrodes With Different Metallic Functions

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: January 18, 1958

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SOV/2o-127-3-34/71

AUTHORS: Nikol'skiy, B. P., Corresponding Member, AS USSR, Parfenov, A. I., Shul'ts, M. M.

TITLE: Electrode Properties, Electrical Conductivity, and Chemical Stability of the Glasses of the System $Li_2O-La_2O_3-SiO_2$

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 3, pp 599-601 (USSR)

ABSTRACT: In the present paper the results obtained by investigations of the above-mentioned properties of the glasses Li_2O-SiO_2 and $Li_2O-La_2O_3-SiO_2$ (Refs 1-4) are confirmed. First, the component properties of the simple system were determined for the purpose of finding out what part each of them plays in the glass. In the course of the investigations of the above-mentioned system, LiO_2 was varied within the limits of 25-33 mol% and La_2O_3 of 0-9 mol%. The electrode properties were investigated at 25 and 95° in solutions with constant Li^+, Na^+ or K^+-ion concentration and a variation of the pH-value of from 0-14. The investigation method has already

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been described in earlier papers (Refs 1, 7). Electrical conductivity was described in the T-interval of from 140-300° according to the method described in reference 8. For the calculation of the molar electrical conductivity λ, density was determined by weighing in water and benzene. The results obtained by measuring electrical conductivity, chemical stability, and density are given in table 1. The measurements showed the following: With the introduction of La_2O_3 and the increase of its content, the resistance of the glasses rises somewhat. On the other hand, the leaching out of the Li of the glasses, which is due to the action of water, is reduced by the introduction of lanthanum oxide. Thus, lanthanum increases the chemical stability of the glasses. The results obtained by investigating the electrode properties at 25° in the given salt solutions and the ion-exchange constant between water and glass are given by table 2. It was found that a variation of the LiO_2-content within the given range influences the limits of the hydrogen function only little (±5 mv). Electrical conductivity varied differently in the

Electrode Properties, Electrical Conductivity, and Chemical Stability of the Glasses of the System $Li_2O-La_2O_3-SiO_2$

various salt solutions with increasing lanthanum content. In the Li-salt solutions, the upper limit of the hydrogen function was shifted towards lower values. With growing La-content also the numerical value of the constant K grows. Li is kept back in the glass. In the Na- and K-salt solutions the limit of the hydrogen function is shifted into the more basic range. Penetration of Na- or K-ions into the glass is not possible owing to the filling effect of lanthanum oxide. For the glasses with La-content, the influence of the alkali ions upon the hydrogen function is given in the following order of magnitude: $Li^+ > Na^+ > K$. At 95° a quite similar dependence of the electrode properties on the composition of the glass and the solutions could be observed, only it is not so sharp. By the introduction of lanthanum into the glasses the limits of the hydrogen function in an acid medium are extended, the electrode properties are stabilized, and also the chemical stability of the glasses is increased. For measurements of the pH-value the glass composed of LiO - 24-28%, LaO - 4-7%, SiO 65-70% (molar) is recommended besides the electrode glass KST (TsLA energochermet) (Ref. 12). For the extension of the

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SOV/20-127-3-34/71

Electrode Properties, Electrical Conductivity, and Chemical Stability of the Glasses of the System $Li_2O-La_2O_3-SiO_2$

limits of the hydrogen function in the basic medium, other components must yet be introduced into the glass. There are 2 tables and 12 references, 7 of which are Soviet.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: May 13, 1959

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PHASE I BOOK EXPLOITATION SOV/5035

Vsesoyuznoye soveshchaniye po steklobraznomu sostoyaniyu. 3d, Leningrad, 1959.

Stekloobraznoye sostoyaniye; trudy Tret'yego vsesoyuznogo soveshchaniya Leningrad, 16-20 noyabrya 1959 (Vitreous State; Transactions of the Third All-Union Conference on the Vitreous State, Held in Leningrad on November 16-20, 1959) Moscow, Izd-vo AN SSSR, 1960. 534 p. Errata slip inserted. 3,200 copies printed. (Series: Its: Trudy)

Sponsoring Agencies: Institut khimii silikatov Akademii nauk SSSR. Vsesoyuznoye khimicheskoye obshchestvo imeni D.I. Mendeleyeva and Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova.

Editorial Board: A.I. Avgustinik, V.P. Barzakovskiy, M.A. Bezborodov, O.K. Botvinkin, V.V.Vargin, A.G. Vlasov, K.S. Yevstrop'yev, A.A. Lebedev, M.A. Matveyev, V.S. Molchanov, R.L. Myuller, Ye.A. Poray-Koshits, Chairman, N.A. Toropov, V.A. Florinskaya, A.K. Yakhkind; Ed. of Publishing House: I.V. Suvorov; Tech. Ed.: V.T. Bochever.

PURPOSE: This book is intended for researchers in the science and technology of glasses.

COVERAGE: The book contains the reports and discussions of the Third All-Union Conference on the Vitreous State, held in Leningrad on November 16-19, 1959. They deal with the methods and results of studying the structure of glasses, the relation between the structure and properties of glasses, the nature of the chemical bond and glass structure, and the crystallochemistry of glass. Fused silica, mechanism of vitrification, optical properties and glass structure, and the electrical properties of glasses are also discussed. A number of the reports deal with the dependence of glass properties on composition, the tinting of glasses and radiation effects, and mechanical, technical, and chemical properties of glasses. Other papers treat glass semiconductors and soda borosilicate glasses. The Conference was attended by more than 300 delegates from Soviet and East German scientific organizations. Among the participants in the discussions were N.V. Solomin, Ye. V. Kuvshinskiy, Yu.A. Gastev, V.P. Pryanishnikov, Yu. Ya. Gotlib, O.P. Mchedlov-Petrosyan, G.P. Mikhaylov, S.M. Petrov, A.N. Lazarev, D.I. Levin, A.V. Shatilov, N.T. Ploshchinskiy, A.Ya. Kuznetsov, E.V. Degtyareva, G.V. Byurganovskaya, A.A. Kalenov, M.M. Skornyakov, P.Ya. Bokin, E.K. Keller, Ye.A. Kuznetsov, V.P. Pozdnev, R.S. Shevelevich, Z.G. Pinsker, and O.S. Molchanova. The final session of the Conference was addressed by Professor I.I. Kitaygorodskiy, Honored Scientist and Engineer, Doctor of Technical Sciences. The following institutes were cited for their contribution to the development of glass science and technology: Gosudarstvennyy opticheskiy institut (State Optical Institute), Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry, AS USSR), Fizicheskiy institut AN SSSR (Physics Institute AS USSR), Fiziko-tekhnicheskiy institut AN SSSR (Physicotechnical Institute AS USSR), Institut fiziki AN BSSR, Minsk (Institute of Physics, Academy of Sciences, Belorusskaya SSR, Minsk), Laboratory of Physical Chemistry of Silicates of the Institut obshchey i neorganicheskoy khimii AN BSSR, Minsk (Institute of General and Inorganic Chemistry, Academy of Sciences, Belorusskaya SSR, Minsk), Institut vysokomolekulyarnykh soyedineniy AN SSSR(Institute of High Molecular Compounds, AS USSR), Gosudarstvennyy institut stekla (State Institute for Glass), Gosudarstvennyy institut steklovolokna (State Institute for Glass Fibers), Gosudarstvennyy institut elektrotekhnicheskogo stekla (State Institute for Electrical Glass), Sibirskiy fiziko-technicheskiy institut, Tomsk (Siberian Physicotechnical Institute, Tomsk),Leningradskiy gosudarstvennyy universitet (Leningrad State University), Moskovskiy khimiko-tekhnologicheskiy institut (Moscow Institute of Chemical Technology),Leningradskiy tekhnologicheskiy institut im. Lensoveta (Leningrad Technological Institut imeni Lensovet), Belorusskiy politekhnicheskiy institut Minsk (Belorussian Polytechnic Institute, Minsk), Novocherkasskiy politekhnicheskiy institut (Novocherkassk Polytechnic Institute), and Sverdlovskiy politekhnicheskiy institut (Sverdlovsk Polytechnic Institute). The Conference was sponsored by the Institute of Silicate Chemistry AS USSR (Acting Director - A.S. Gotlib), the Vsesoyuznoye khimicheskoye obshchestvo im. D.I. Mendeleyeva (All-Union Chemical Society imeni D.I. Mendeleyev), and the Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova (State "Order of Lenin" Optical Institute imeni S.I. Vavilov). The 15 resolutions of the Conference include recommendations to organize a Center for the purpose of coordinating the research on glass, to publish a new periodical under the title "Fizika i khimiya stekla" (Physics and Chemistry of Glass), and to join the International Committee on Glass. The Conference thanks A.A. Lebedev, Academician, Professor, and Chairman of the Organization Committee; Ye.A. Poray-Koshits, Doctor of Physics and Mathematics, Member of the Organizational Committee; and R.L. Myuller, Doctor of Chemical Sciences, Member of the Organizational Committee. The editorial board thanks G.M. Bartenev, M.V. Vol'kenshteyn, L.I. Demkina, D.P. Dobychin, S.K. Dubrovo, V.A. Ioffe, and B.T. Kolomiyets. References accompany individual reports.

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AUTHOR: Shul'ts, M. M.

TITLE: Theory of the Glass Electrode and Some Problems of Glass Chemistry

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1960, No. 4, pp 40-48

TEXT: This is a review of studies performed at the kafedra fizicheskoy khimii LGU (Chair of Physical Chemistry of Leningrad State University), which base upon B. P. Nikol'skiy's theory of the glass electrode. The principles set up by this research scientist are formulated. 1) Between the glass surface and the solution, an exchange between hydrogen and metal ions occurs. 2) The ion activity on the glass surface is equal to the total ion concentration in this phase. 3) The potential difference between glass and solution depends on the difference between the chemical potentials of the ions in the glass and in the solution. 4) If all sodium ions of the glass surface have been exchanged for hydrogen, the glass behaves like a hydrogen electrode. These postulates were experimentally proved by papers

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Theory of the Glass Electrode and Some Problems of Glass Chemistry
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of T. A. Tolmacheva (Refs. 8, 9), Ye. A. Materova, V. V. Moiseyev (Refs. 10-13), and by the author (Ref. 14). There followed papers which aimed at: 1) The practical application of the theory for the purpose of studying the chemical nature of glass (N. P. Isakova, Refs. 15, 16). 2) The development of glass electrodes for measuring the concentration of sodium ions within a wide pH range (N. V. Peshekhonova, P. A. Kryukov, Refs. 17-22). 3) Development of glass electrodes for pH measurement of highly alkaline or highly acid solutions at high temperatures. This work was carried out jointly with the kafedra tekhnologii stekla LTI (Chair of Glass Technology of the Leningrad Technological Institute) and other organizations such as TsLA ChERMET (Central Laboratory of the Institute of Ferrous Metallurgy), GIS (State Glass Institute), and SKBPSA. Glass electrodes permitting measurements between pH = -2 and pH = 14 between 0 - 100°C are now available for use in industry. N. A. Izmaylov, G. P. Avseyevich, S. I. Sokolov, A. G. Pasynskiy, and O. V. Mazurin are mentioned. There are 43 references: 37 Soviet, 3 US, 2 British, and 2 German.

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RUSANOV, A.I.; SHUL'TS, M.M.

Simplified Le Chatelier - Braun principle. Vest. LGU 15 no.4:60-65
'60. (MIRA 13:2)
(Thermodynamics)

84246

S/076/60/034/009/004/022
B015/B056

245300 also 2209

AUTHORS: Storonkin, A. V. and Shul'ts, M. M.

TITLE: Some Problems of the Thermodynamics 71 of Heterogeneous Multicomponent Systems. II. The Necessary Conditions for the Stability of Heterogeneous Systems

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 9, pp. 1928-1932

TEXT: The present article deals with the generally necessary conditions
for a stability of heterogeneous systems with respect to continuous
changes in state. The authors proceed from the Gibbs' inequality
$d\overline{T}d\eta - dp\overline{dv} + d\mu_1\overline{dm}_1 + d\mu_2\overline{dm}_2 + \dots\dots + d\mu_n\overline{dm}_n > 0$ (1) from
(T, p, μ_1 ... μ_n - temperature, pressure, and chemical potentials (i.e.,
the intensive properties) and $\overline{\eta}$, $\overline{v}$, $\overline{m}_1$ ..... $\overline{m}_n$ - entropy, volume, and
mass of the components (the extensive properties) in order then to refer
the interrelation between the changes in intensive and extensive parameters

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Some Problems of the Thermodynamics of Heterogeneous Multicomponent Systems. II. The Necessary Conditions for the Stability of Heterogeneous Systems

to the heterogeneous system as a whole. The heterogeneous system will then, as a whole, be in the state of stable equilibrium, when all coexisting phases are stable with respect to continuous changes of state. Thus, the inequality (1) must hold for every phase in stable equilibrium. It is found that under certain conditions, the conjugate intensive and extensive parameters of a heterogeneous system always change in the same direction, with the exception of pressure and volume, which always change in the opposite direction. On the basis of the inequality

$$\left(\frac{d\mu_i}{dm_i}\right)_{T,p,m_1,\dots\dots,m_{i-1},m_{i+1},\dots\dots,m_n} > 0 \quad (7)$$

derived, the conclusion is drawn that an isothermal-isobaric change in the total content of a given component of the heterogeneous system is accompanied by a change in the chemical potential of this component proceeding in the same way, provided the total content of each of the other components remains constant, and that the phase composition changes during the process investigated. If the total composition of the heterogeneous system is

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Some Problems of the Thermodynamics of Heterogeneous Multicomponent Systems. II. The Necessary Conditions for the Stability of Heterogeneous Systems

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expressed by the molar fractions (x_i) of the components, the following inequality may be derived:

$$\left(\frac{d\mu_i}{dx_i}\right)_{T,p,\frac{x_1}{x_n},\dots,\frac{x_{i-1}}{x_n},\frac{x_{i+1}}{x_n},\dots\frac{x_{n-1}}{x_n}} > 0 \qquad (12)$$

Like in the case of the inequality (12), an inequality (13) may be written down for a homogeneous body or a phase of the heterogeneous system, which represents the interrelation between the changes of the chemical potentials and the molar fractions of the components of a homogeneous body or of a phase of a heterogeneous system. In the next report it is intended to be shown that the problem of the interrelation between the changes of chemical potentials of the components and the compositions of the coexisting phases can be solved with the aid of the inequalities (7) or (12). There are 7 Soviet references.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: November 15, 1958

Card 3/3

84626

S/076/60/034/010/003/022
B015/B064

5.4210 2209, 1273 only

AUTHORS: Storonkin, A. V. and Shul'ts, M. M.

TITLE: Some Problems of the Thermodynamics of Heterogeneous Multicomponent Systems. III. The Relation Between the Changes of the Chemical Potentials of the Components and the Isothermal-isobaric Changes of the Phase Composition

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 10, pp. 2167-2173

TEXT: Proceeding from ternary two-phase systems, the authors study the changes of the chemical potential and the partial pressures of the components at an isothermal-isobaric change of the composition of heterogeneous multi-component systems and formulate the conditions for the extremum of these criteria. Already deduced conditions studied by D. S. Korzhinskiy (Ref. 3) as well as equations derived by the authors (Refs 2,4) are the basis of discussions of the present investigation

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Some Problems of the Thermodynamics of Heterogeneous Multicomponent Systems. III. The Relation Between the Changes of the Chemical Potentials of the Components and the Isothermal isobaric Changes of the Phase Composition

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$$\left(\frac{d\mu_i}{d\,x_i}\right)_{P,T,x_k/x_l} > 0 \qquad (1)$$

(x_i, x_k, x_l = total molar ratios characterizing the composition of the heterogeneous system as a whole). Equation (1) holds for a ternary two-phase system saying that the chemical potential of a given component and its total molar ratio change always simultaneously in the ternary two-phase system if temperature, pressure, and the molar ratio of the two other components remain constant. In the case of a solution of the Gibbs-Duhem equation for the coexisting phases for the conditions the extremum of the chemical potential of an arbitrary component i the expression $\left[d\mu_i\right]_{P,T} = 0$ is given if $\frac{x_k^{(1)}}{x_l^{(1)}} = \frac{x_k^{(2)}}{x_l^{(2)}}$ (3); this expression shows

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